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9th Class Mathematics Solved Notes Unit 4

Unit-4: Algebraic Expressions and Algebraic Solution Solved Notes

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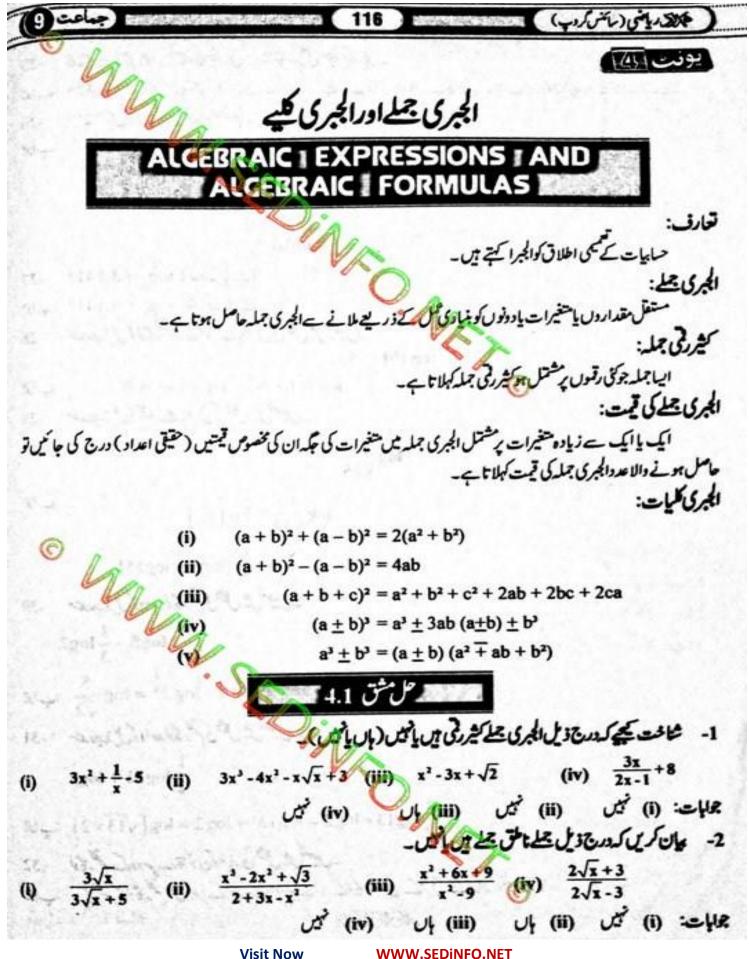


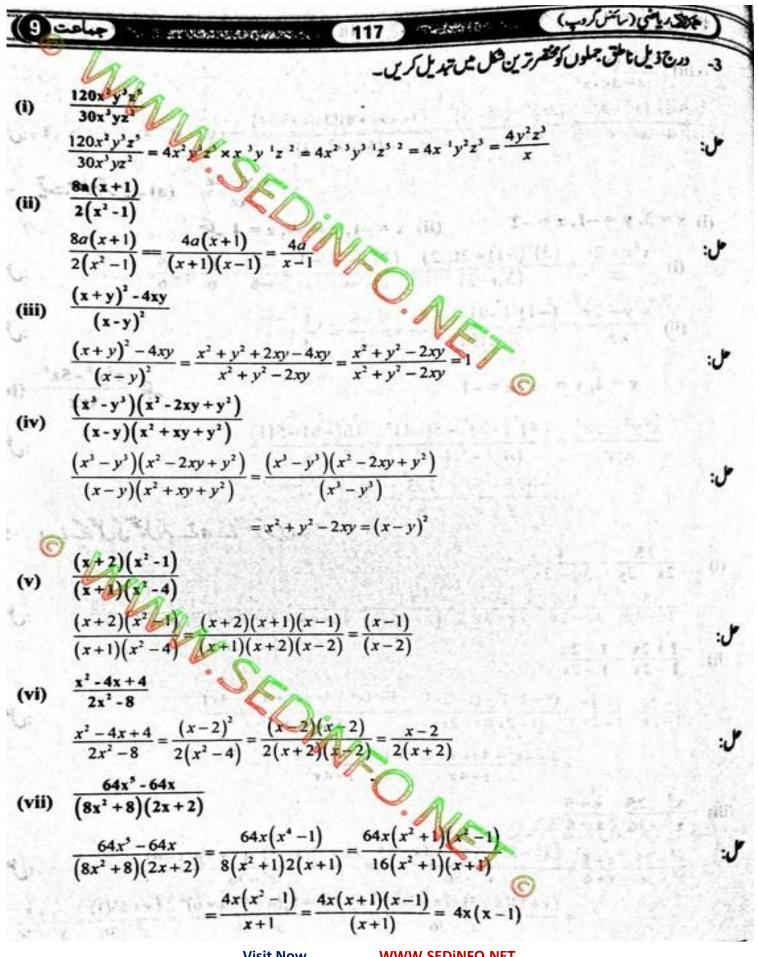
مزید نوٹس، گزشته پیپرز، ٹیسٹ پیپرز، گیس پیپرز، ڈیٹ شیٹ، رزلٹ اور بہت کچھ۔ انجمی وزٹ کریں! www.sedinfo.net





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(viii)
$$\frac{9x^3 - (x^3 - 4)^2}{4 + 3x - x^2} = \frac{(3x^3 - x^2 + 4)(3x + x^2 - 4)}{(3x - x^2 + 4)} = (3x + x^2 - 4) = x^3 + 3x - 4$$

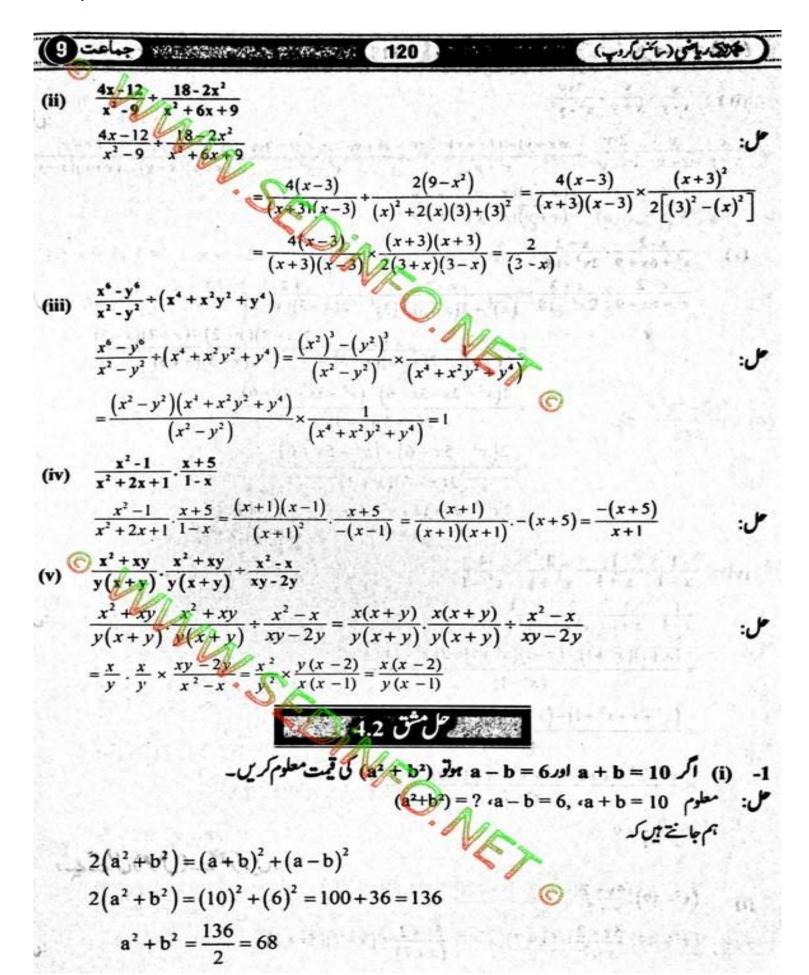
(i) $x = 3$, $y = -1$, $z = -2$
(ii) $\frac{x^3y - 2z}{xz} = \frac{(3)^3 (-1) - 2(-2)}{(3)(-2)} = \frac{(27)(-1) + 4}{4} = \frac{-23}{6} = \frac{23}{6} =$

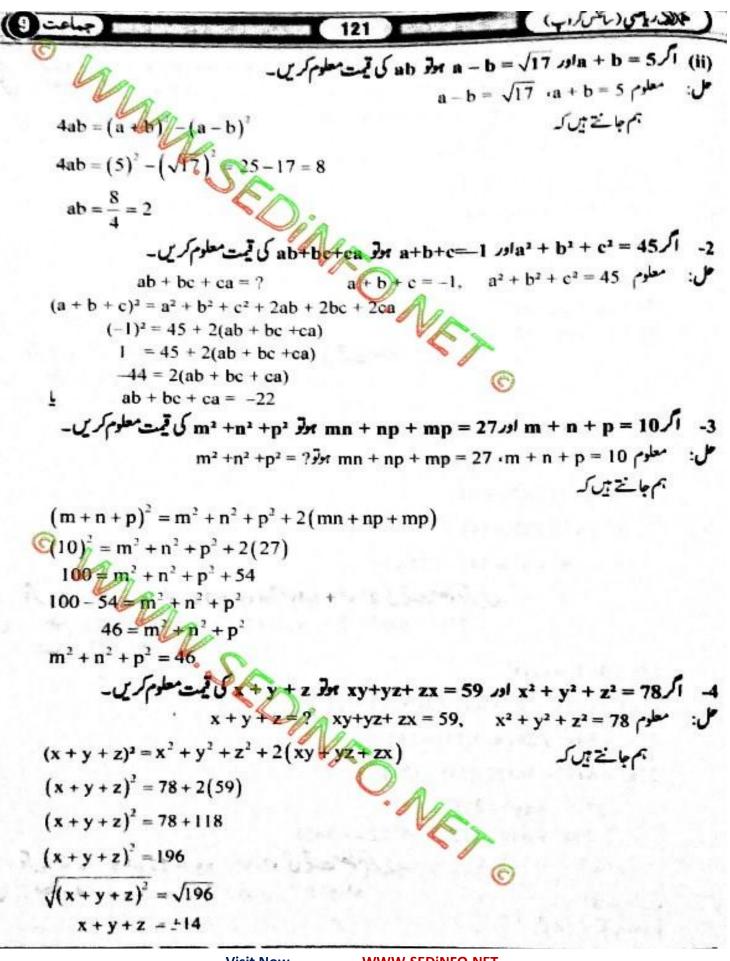
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(iv)
$$\frac{x}{x-y} = \frac{y}{x+y} = \frac{2xy}{x^2-y^2}$$
 $\frac{x(x+y)-y(x-y)-2xy}{x^2-y^2} = \frac{x^2+xy-xy+y^2-2xy}{x^2-y^2} = \frac{x^2+y^2-2xy}{(x+y)(x-y)} = \frac{(x-y)^3}{(x+y)(x-y)}$

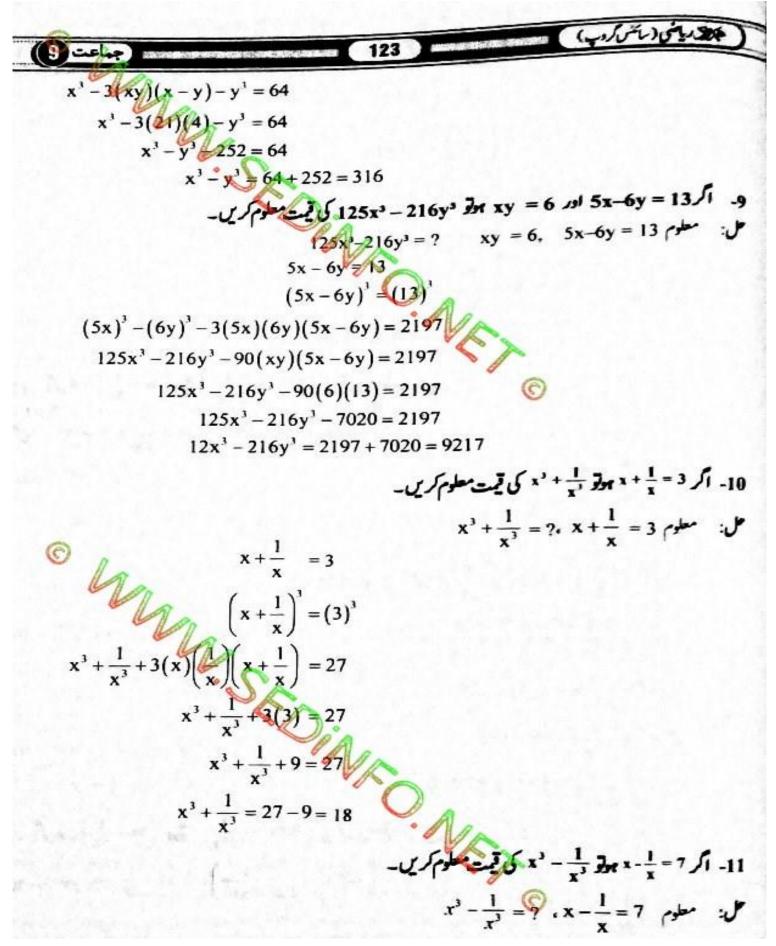
$$= \frac{(x-y)(x-y)}{(x+y)(x-y)} = \frac{x-y}{x+y}$$
(v) $\frac{x-2}{x^2+6x+9} = \frac{x+2}{2x^2-18}$ $\frac{x+2}{(x^3)^2-2(x+3)(x-3)} = \frac{x+2}{(x^3)^2-2(x+3)(x-3)} = \frac{x+2}{2(x-3)(x+3)^2}$ $= \frac{x^2-2}{(x+3)^2} - \frac{x+2}{2(x+3)(x-3)} = \frac{2(x-3)(x-2)-(x+2)(x+3)}{2(x-3)(x+3)^2}$

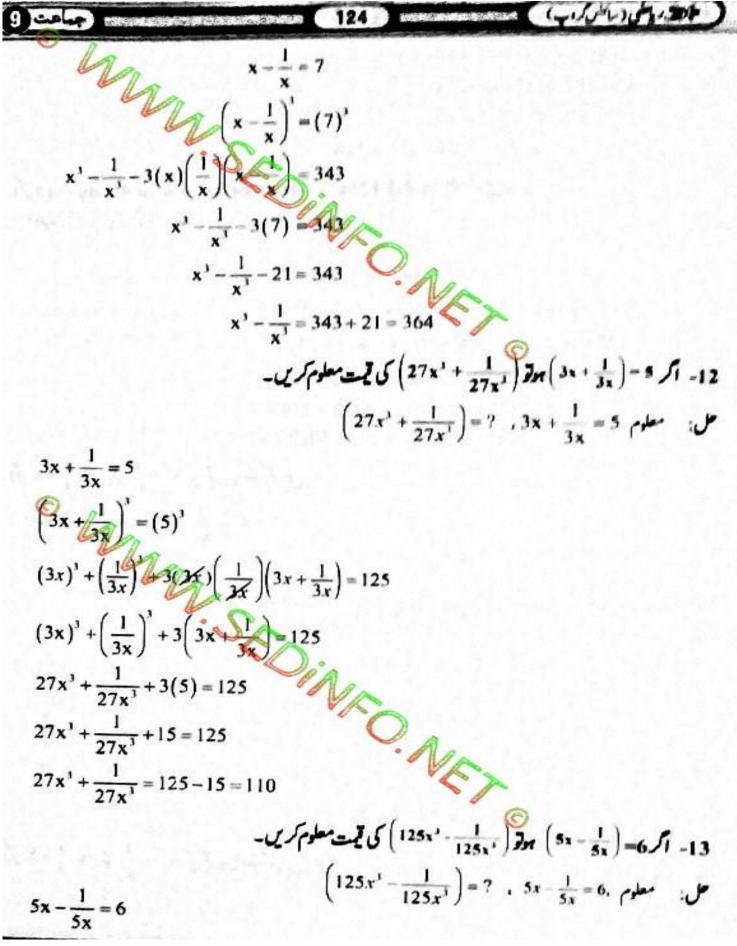
$$= \frac{2(x^2-2x-3x+6)-(x^2+3x+2x+6)}{2(x-3)(x+3)^2} = \frac{2(x^2-3)(x+3)^2}{2(x-3)(x+3)^2}$$
(vi) $\frac{1}{x-1} = \frac{1}{x+1} = \frac{2}{x^2+1} = \frac{4}{x^2-1}$ $= \frac{(x+1)(x+y)-(x+1)-2(x^2-1)-4}{(x^2-1)} = \frac{(x^2+x+x^2+1)-(x+x^2+1)-2(x^2-1)-4}{(x^2-1)} = \frac{(x^2+x+x^2+1)-(x+x^2+1)-2(x^2-1)-4}{(x^2-1)} = \frac{(x^2+x+x^2+1)-(x+x^2+1)-2(x^2-1)-4}{(x^2-1)} = \frac{x^3+x^2+x+1-x^3+x^2-x+1-x^2+2-4}{x^2-1} = \frac{0}{x^2-1} = 0$
(ii) $(x^2-49) \cdot \frac{5x+2}{x+7} = (x+7)(x-7) \cdot \frac{5x+2}{(x+7)} = (x-7)(5x+2)$

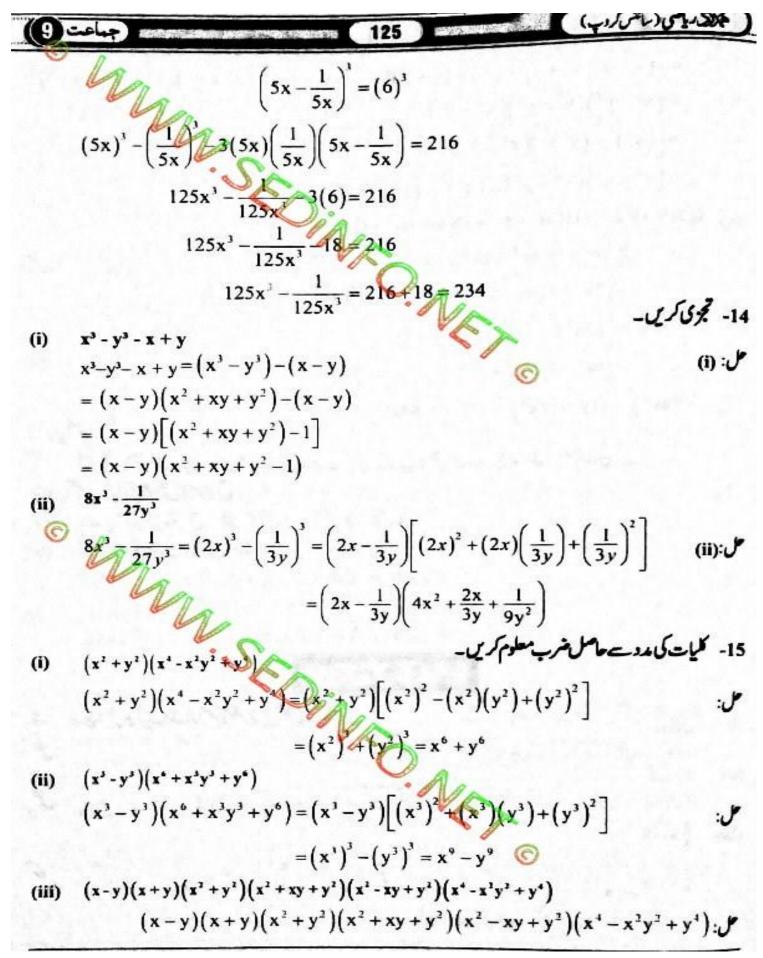












🛲 طمثق 4.3

(i)
$$\sqrt{180} = \sqrt{2 \times 2 \times 3 \times 3 \times 5} = \sqrt{2^2 \times 3^2 \times 5} = 6\sqrt{2}$$

(ii) $\sqrt{180} = \sqrt{2 \times 2 \times 3 \times 3 \times 5} = \sqrt{2^2 \times 3^2 \times 5} = 6\sqrt{2^2 \times 3^2 \times 5} = 6\sqrt{2$

(ii) $3\sqrt{162}$

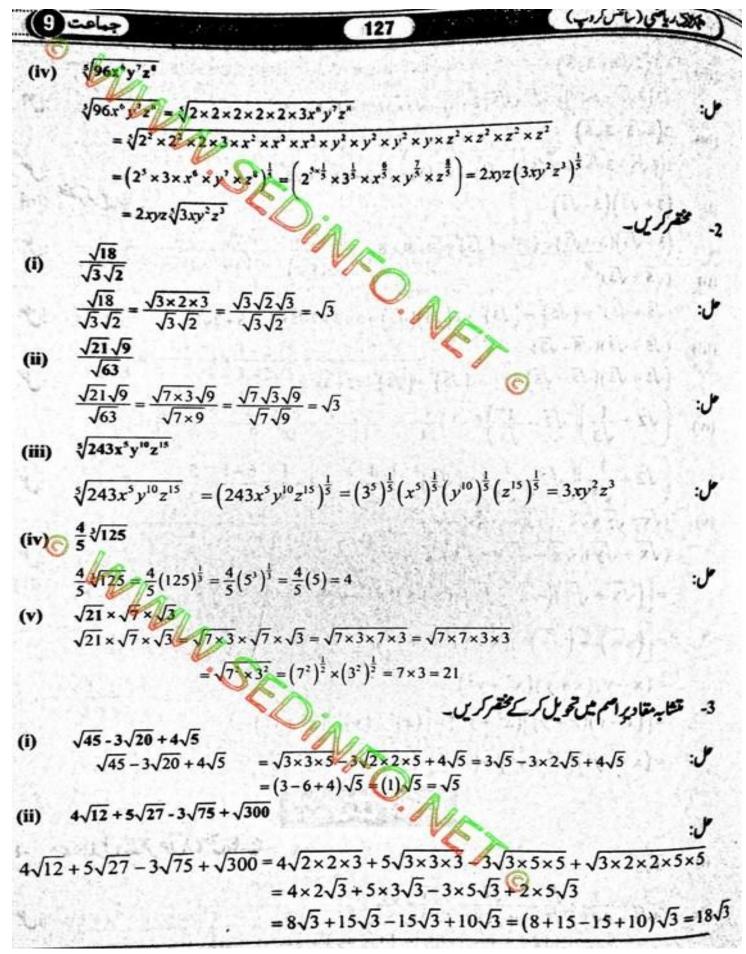
$$3\sqrt{162} = 3\sqrt{2 \times 3 \times 3 \times 3 \times 3} = 3\sqrt{2 \times 3^2 \times 3^2} = 3\times 3\times 3\sqrt{2} = 27\sqrt{2}$$

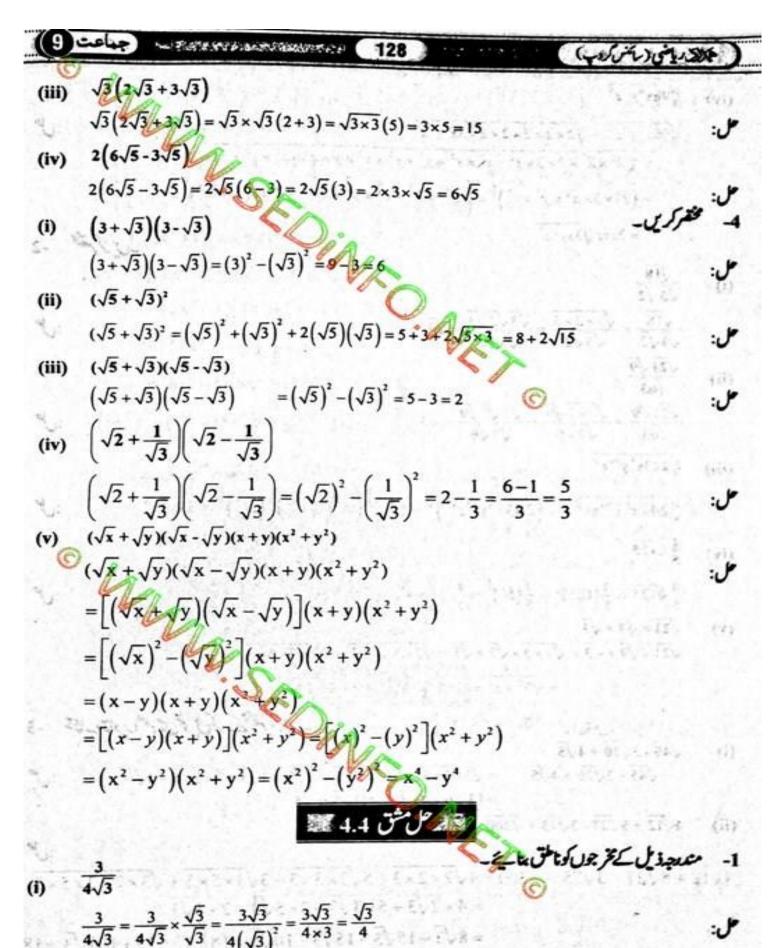
3 √128 (iii)

$$\frac{3}{4}\sqrt[3]{128} = \frac{3}{4}(128)^{1/3} = \frac{3}{4}(2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2)^{\frac{1}{3}} = \frac{3}{4}(2^3 \times 2^3 \times 2)^{\frac{1}{3}}$$

$$= 2 \times 2 \times \frac{3}{4}\sqrt[3]{2} = 3\sqrt[3]{2} = 3\sqrt[3]{2}$$
:.

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(iii)
$$\frac{14}{\sqrt{58}} = \frac{14}{\sqrt{58}} \times \frac{\sqrt{58}}{\sqrt{58}} = \frac{14\sqrt{98}}{(\sqrt{58})^3} = \frac{14\sqrt{98}}{98} = \frac{\sqrt{98}}{7} = \frac{\sqrt{7} \times 7 \times 2}{7} = \frac{7\sqrt{2}}{7} = \sqrt{2}$$

(iii) $\frac{6}{\sqrt{8}\sqrt{27}} = \frac{6}{\sqrt{216}} \times \frac{\sqrt{216}}{\sqrt{216}} \times \frac{6\sqrt{216}}{\sqrt{216}} = \frac{6\sqrt{6} \times 6 \times 6}{216} = \frac{6 \times 6\sqrt{6}}{216} = \frac{\sqrt{6}}{6}$

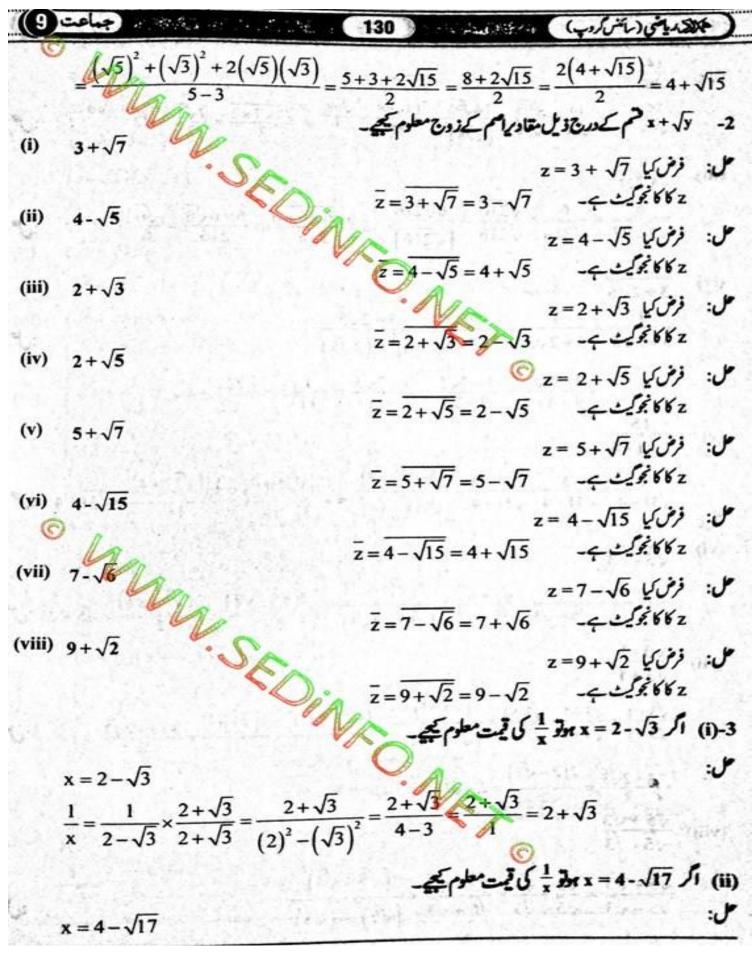
(iv) $\frac{1}{3+2\sqrt{5}} = \frac{1}{3+2\sqrt{5}} \times \frac{3-2\sqrt{5}}{3-2\sqrt{5}} = \frac{3-2\sqrt{5}}{(3)^3-(2\sqrt{5})^3} = \frac{3-2\sqrt{5}}{(3)^3-(2\sqrt{5})^3} = \frac{3-2\sqrt{5}}{31-4} = \frac{15}{\sqrt{31}-4} \times \frac{\sqrt{31}+4}{\sqrt{31}+4} = \frac{15(\sqrt{31}+4)}{(\sqrt{31})^3-(4)^2} = \frac{15(\sqrt{31}+4)}{31-16} = \frac{15(\sqrt{31}+4)}{15} = \sqrt{31}+4 : \text{U}$

(vi) $\frac{2}{\sqrt{5}} = \frac{2}{\sqrt{5}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}} = \frac{2(\sqrt{5}+\sqrt{3})}{(\sqrt{5})^3-(\sqrt{3})^3} = \frac{2(\sqrt{5}+\sqrt{3})}{5-3} = \frac{2(\sqrt{5}+\sqrt{3})}{2} = \sqrt{5}+\sqrt{3} : \text{U}$

(vii) $\frac{\sqrt{3}-1}{\sqrt{3}+1} \times \frac{\sqrt{3}-1}{\sqrt{3}+1} \times \frac{\sqrt{3}-1}{\sqrt{3}-1} = \frac{(\sqrt{3})^3}{(\sqrt{5})^3-(\sqrt{3})^3} = \frac{2(\sqrt{5}+\sqrt{3})}{3-1} = \frac{3+1-2\sqrt{3}}{2} : \text{U}$

$$\frac{4-2\sqrt{3}}{2} = \frac{2(2-\sqrt{3})}{\sqrt{5}-\sqrt{3}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}} = \frac{(\sqrt{5})^3}{(\sqrt{5})^3-(\sqrt{3})^2} = \frac{(\sqrt{5}+\sqrt{3})^3}{(\sqrt{5})^3-(\sqrt{3})^2} = \frac{3+1-2\sqrt{3}}{2} : \text{U}$$

(viii) $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}} = \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}} = \frac{(\sqrt{5}+\sqrt{3})^2}{(\sqrt{5})^3-(\sqrt{3})^2} = \frac{(\sqrt{5}+\sqrt{3})^2}{(\sqrt{5})^3-(\sqrt{3})^2} = \frac{3+1-2\sqrt{3}}{3-1} : \text{U}$



$$\frac{1}{x} \frac{1}{\sqrt{17}} \times \frac{4 + \sqrt{17}}{4 + \sqrt{17}} = \frac{4 + \sqrt{17}}{(4)^2 - (\sqrt{17})^2} = \frac{4 + \sqrt{17}}{16 - 17} = \frac{4 + \sqrt{17}}{-1}$$

$$= -(4 + \sqrt{17}) = -4 - \sqrt{17}$$

$$\therefore x = \sqrt{3} + 2$$

$$\frac{1}{x} = \frac{1}{\sqrt{3} + 2} \times \frac{\sqrt{3} - 2}{\sqrt{3} - 2} = \frac{\sqrt{3} - 2}{(\sqrt{3})^3} = \frac{\sqrt{3} - 2}{3 - 4} = \frac{\sqrt{3} - 2}{-1} = -\sqrt{3} + 2$$

$$x + \frac{1}{x} = \sqrt{3} + 2 - \sqrt{3} + 2 = 4$$
(i)
$$\frac{1 + \sqrt{2}}{\sqrt{5} + \sqrt{3}} + \frac{1 - \sqrt{2}}{\sqrt{5} - \sqrt{3}} = \frac{1 + \sqrt{2}}{\sqrt{5} + \sqrt{3}} \times \frac{\sqrt{5} - \sqrt{3}}{\sqrt{5} - \sqrt{3}} + \frac{1 - \sqrt{2}}{\sqrt{5} - \sqrt{3}} \times \frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{(\sqrt{5})^2 - (\sqrt{3})^2} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{(\sqrt{5})^2 - (\sqrt{3})^2}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{5 - 3} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - 3}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{5 - 3} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - 3}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{5 - 3} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - 3}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{2} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - 3}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{2} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - 3}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{5 - 3} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - 3}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{2} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - 3}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{5 - \sqrt{3}} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - 3}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{5 - \sqrt{3}} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - 3}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{5 - \sqrt{3}} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - \sqrt{3}}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{5 - \sqrt{3}} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - \sqrt{3}}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{5 - \sqrt{3}} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - \sqrt{3}}$$

$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{5 - \sqrt{3}} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - \sqrt{3}}$$

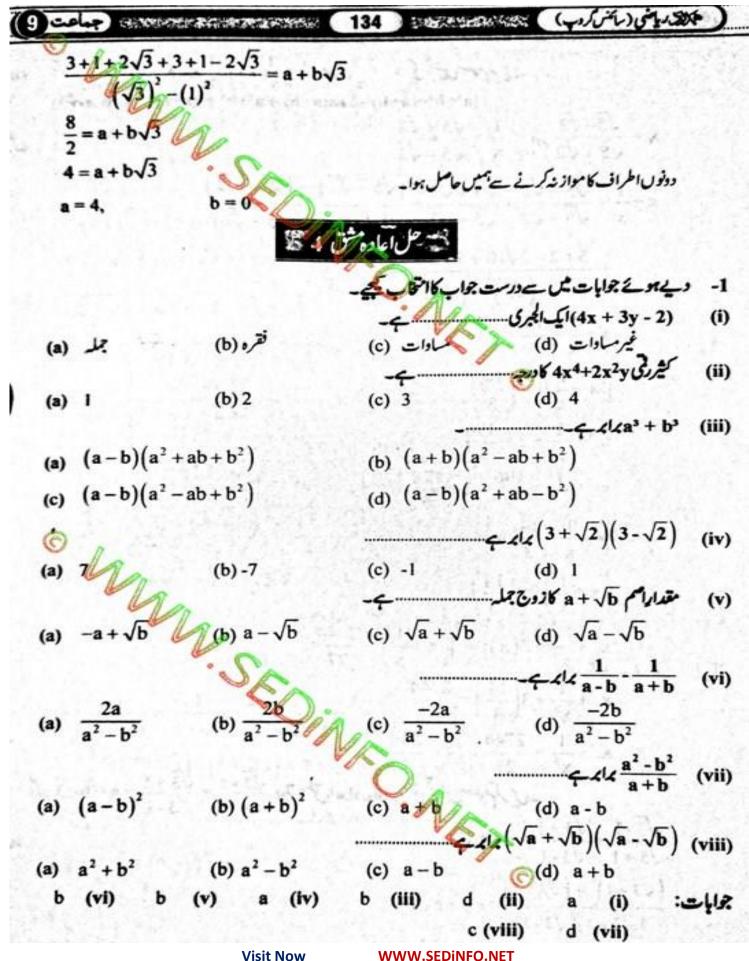
$$= \frac{(1 + \sqrt{2})(\sqrt{5} - \sqrt{3})}{5 - \sqrt{3}} + \frac{(1 - \sqrt{2})(\sqrt{5} + \sqrt{3})}{5 - \sqrt{3}}$$

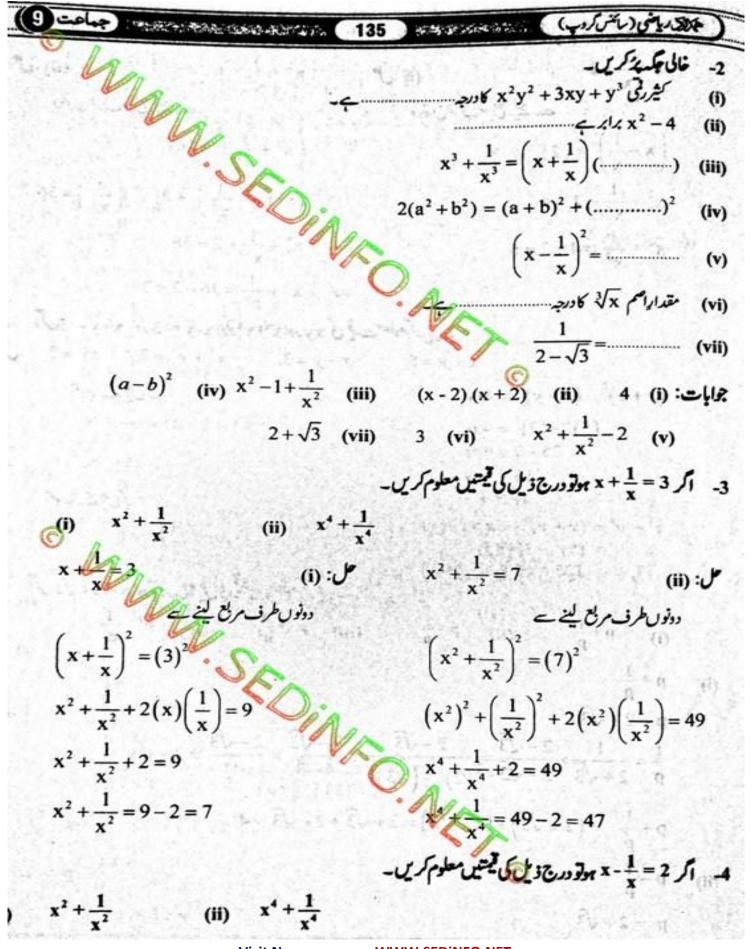
$$= \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3})}{2}$$

$$= \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3})}{2}$$

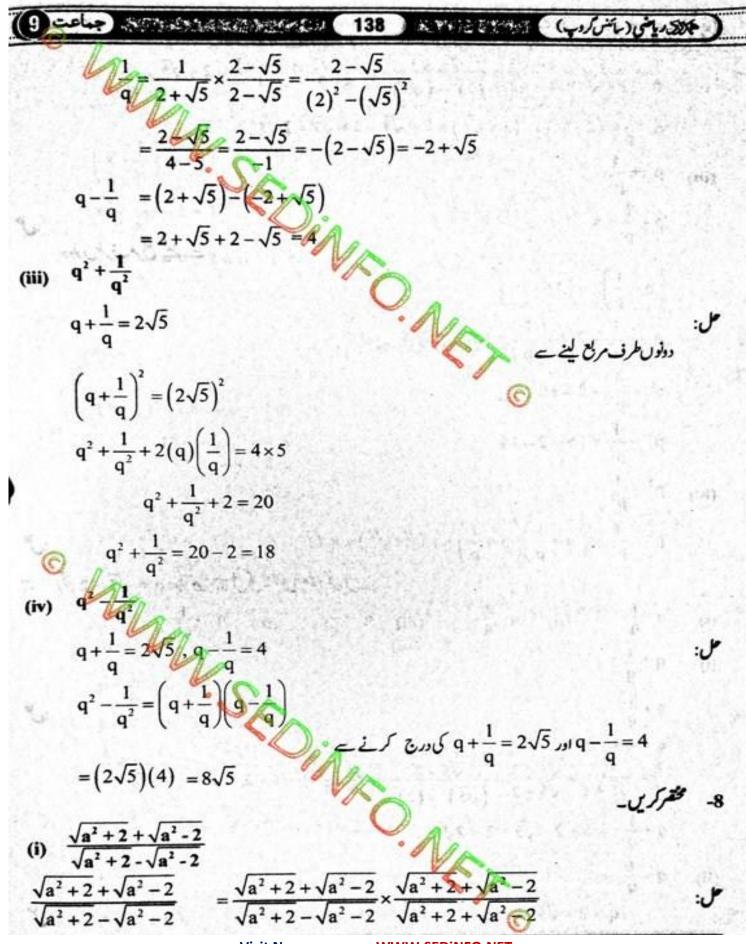
$$= \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3})}{2}$$

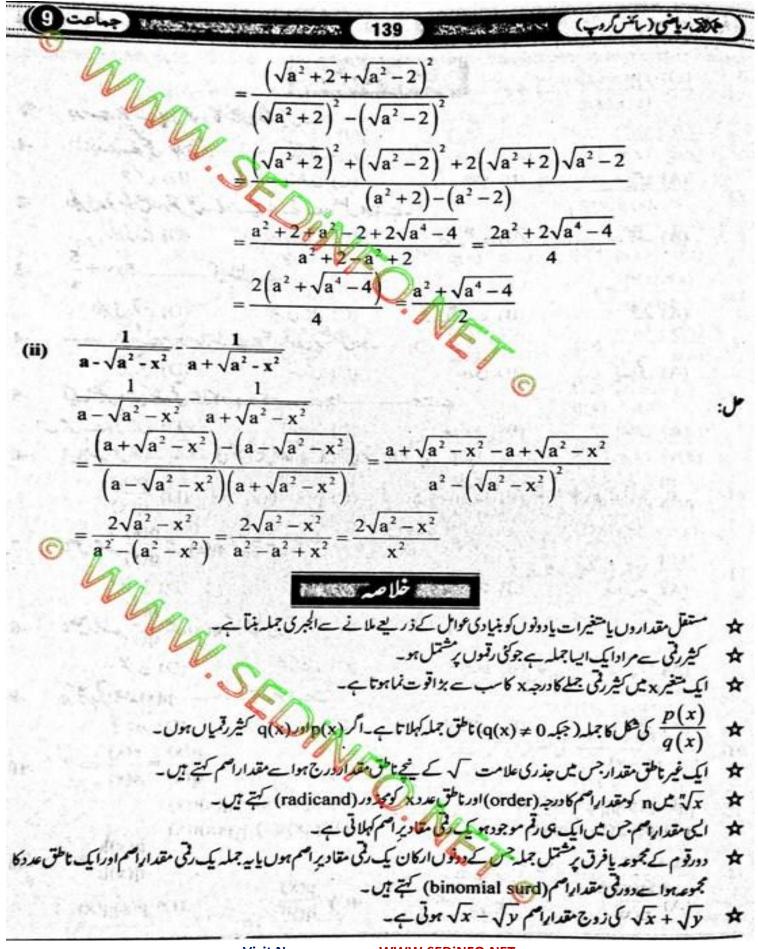
$$= \frac{(1 + \sqrt{3})}{2} + \frac{(1 + \sqrt{3}$$



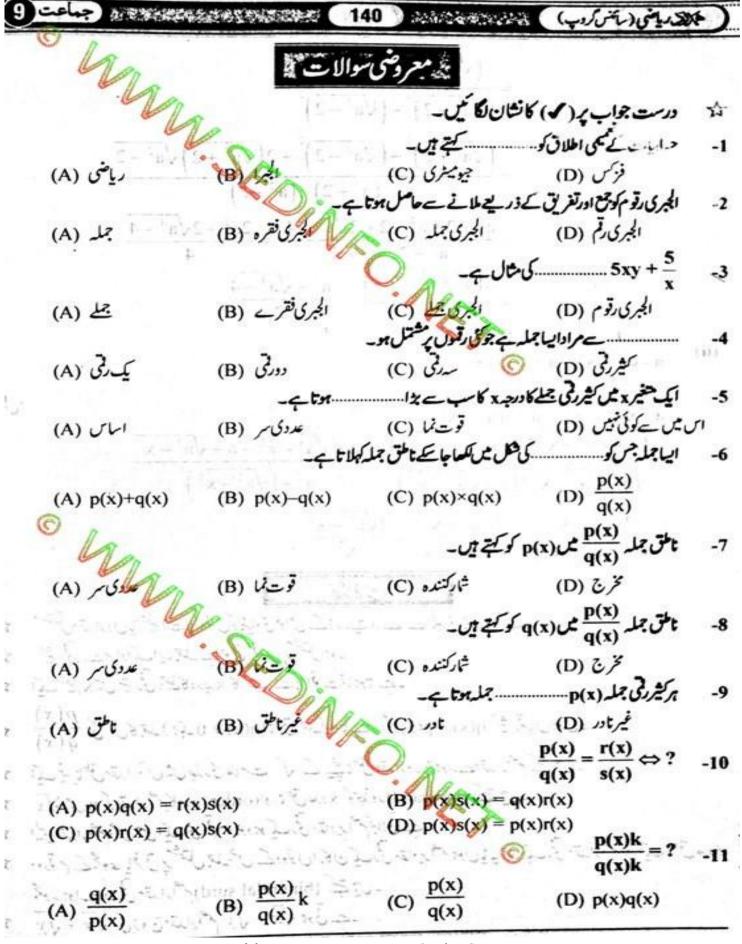


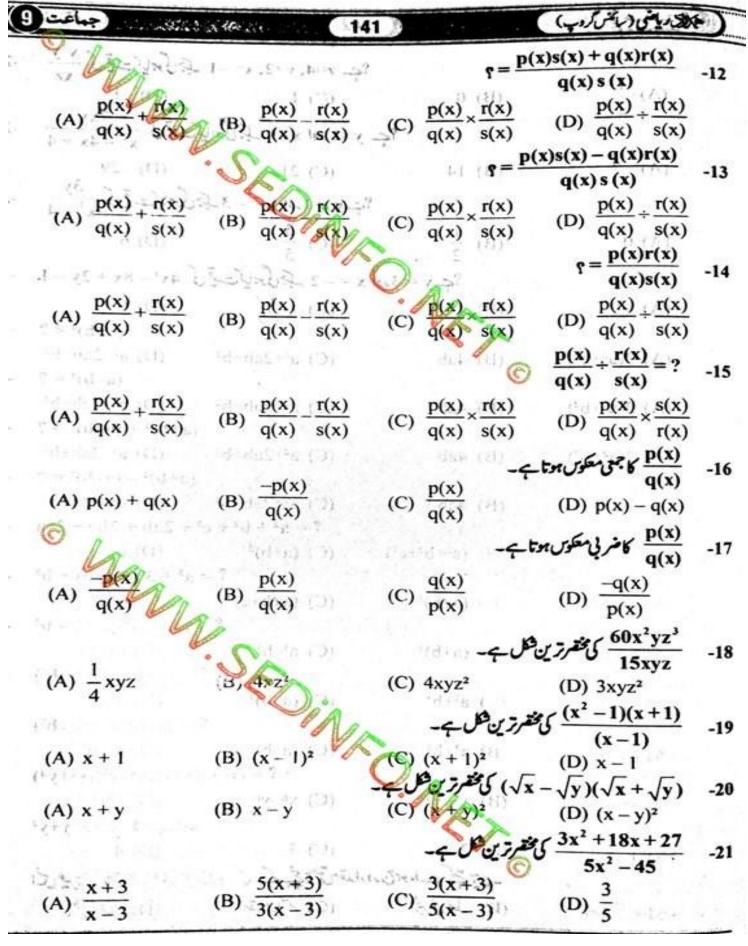


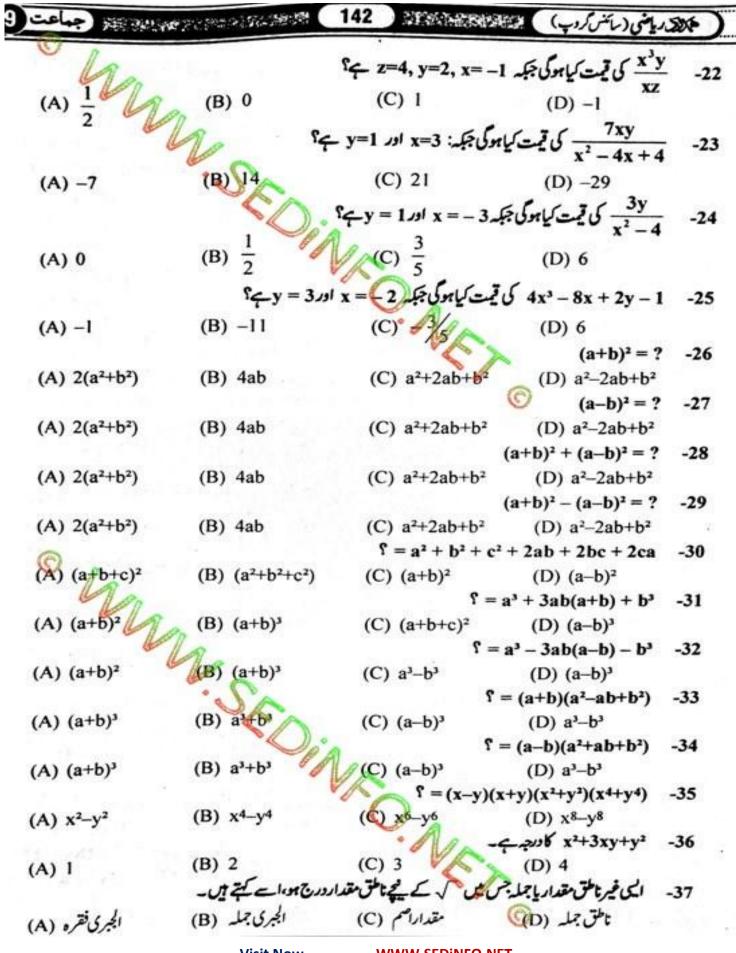


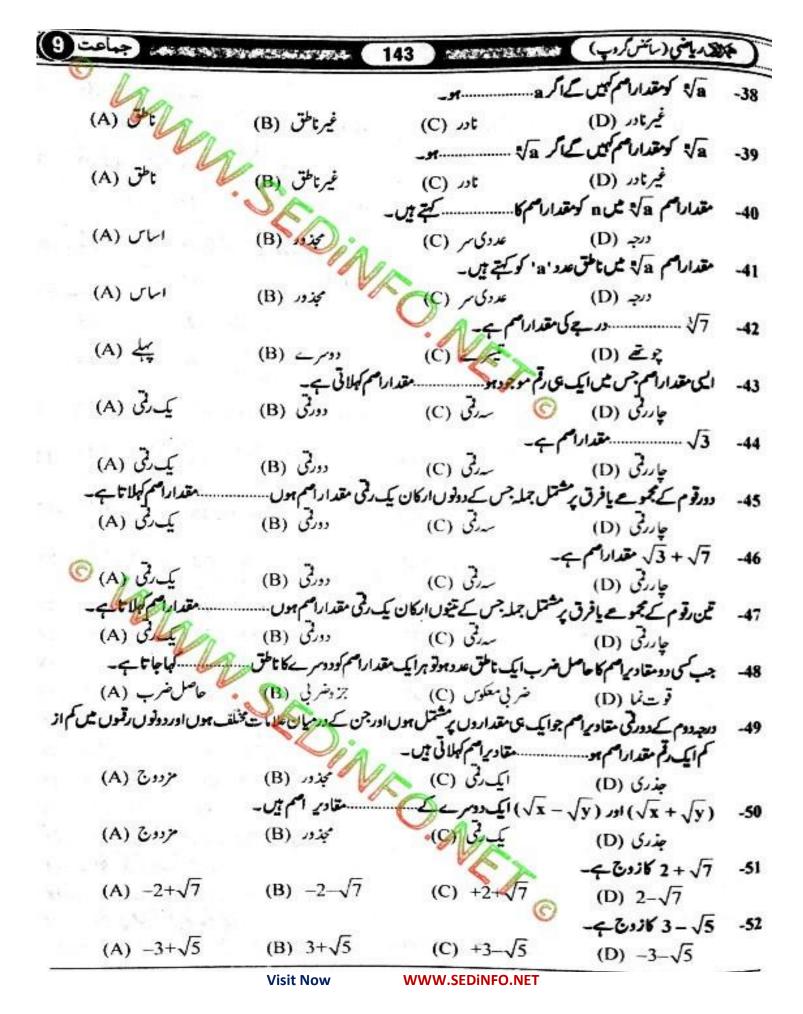


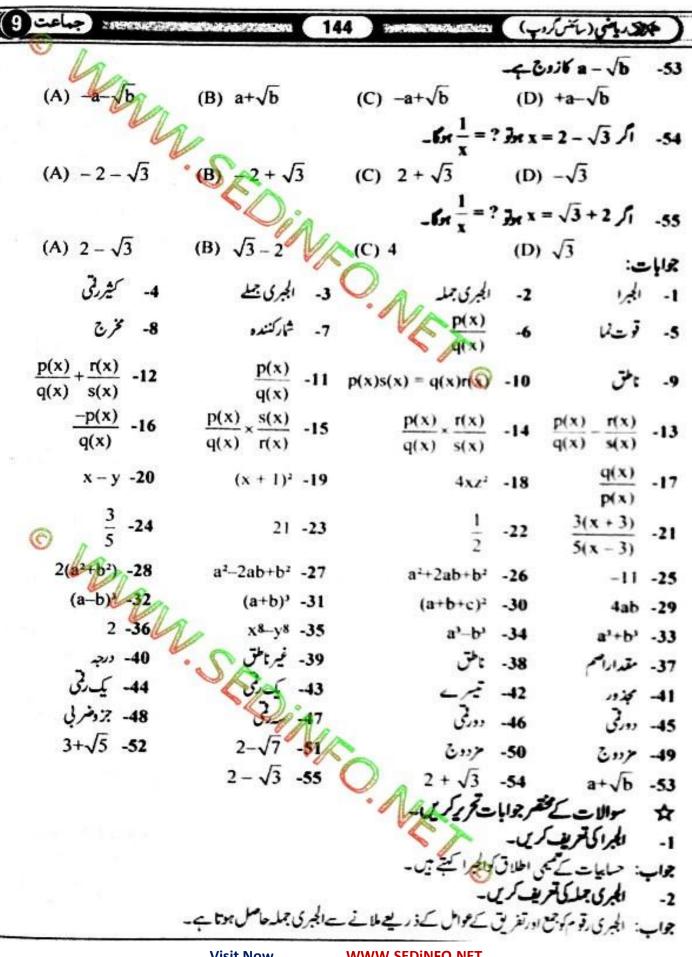
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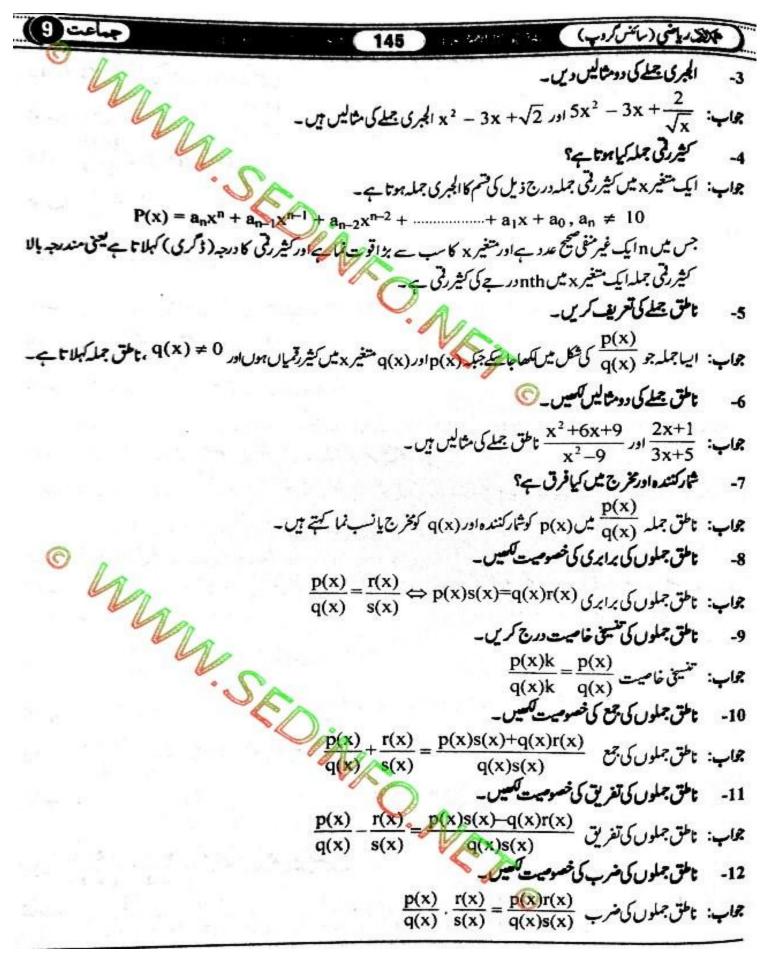












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